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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,929	08/28/2006	Zhen Wang	8231.019	4162

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EXAMINER	
KILPATRICK, BRYAN T	
ART UNIT	PAPER NUMBER
1772	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,929	WANG, ZHEN	
	Examiner	Art Unit	
	BRYAN T. KILPATRICK	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 27 August 2010 has been entered.

Response to Amendment

1. The arguments/remarks and amendments filed on 27 August 2010 have been entered and fully considered.

2. Instant claims 1 and 17 have been amended by Applicant's amendment.

3. Instant claim 20 is newly added by Applicant's amendment.

4. Instant claims 1-20 are pending currently.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

Claims 1 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrase "…number of variables thereof…" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "…number of variables thereof…"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claims 1 and 17 both recite the limitation "…which include regressive equations of fuel composition…" The limitation implies that the equation set of the instant claim can vary and does not clearly recite a specific type of equation set.

Claim 1 recites the limitation "…the unknown variables…" in line 2 of section "h)". There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites the limitation "…the unknown variables…" in the "means for solving the solution to the equation set…" limitation. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 17-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent 4,969,408 (Archer et al.).

In regards to instant claims 1-2, Archer et al. discloses a system for monitoring combustion of coal in a boiler (Abstract). The system determines air/fuel mixture for burning coal in a boiler (Abstract); the system determines characteristics of the fuel by continuously analyzing fuel using a bulk material analyzer for coal to determine compositions and heating values for coal and ash (col. 1, lines 53-56). A boiler model is used for predicting operating conditions (Abstract). Archer et al. recites (in claims 7-8) a method of using a computer to monitor combustion of coal to heat a boiler comprised of steps of a) analyzing samples of coal to determine coal composition; b) calculating a heating value of the coal; c) determining desired operating conditions; d) measuring steam flow, temperature and pressure in the boiler, air and coal supply rates, wall and surface temperatures of the boiler and oxygen concentration in the stack gases; e) modeling boiler performance in dependence upon the steam flow, temperature and pressure, the air and coal supply rates, the coal composition and the heating value of the coal to predict heat loss in the stack gases; and f) determining an air /fuel mixture capable of maintaining the desired operating conditions. Archer et al. discloses (Fig. 5 and col. 4, lines 9-20) that periodic unburned fuel measurements (46 of Fig. 5) are correlated (48 of Fig. 5) with measurements for coal composition (40 of Fig. 5) and boiler operation measurements (44 of Fig. 5) in order to model boiler performance (49 of Fig. 5), which is then used to determine optimum air/fuel mixture (50 of Fig. 5).

In regards to instant claims 17 and 20, Archer et al. recites in claims 7-8 a method of using a computer to monitor combustion of coal to heat a boiler comprised of several steps (see rejection of instant claims 1-2). Archer et al. recites in claims 9-11 a system for monitoring combustion of coal in a boiler comprising a bulk material analyzer, measurement means for measuring several criteria, input means for inputting periodic measurements, and a processing means for modeling boiler performance. Archer et al. discloses (Fig. 5) that periodic unburned fuel measurements (46 of Fig. 5) are correlated (48 of Fig. 5) with measurements for coal composition (40 of Fig. 5) and boiler operation measurements (44 of Fig. 5) in order to model boiler performance (49 of Fig. 5), which is then used to determine optimum air/fuel mixture (50 of Fig. 5) - all of which is performed by a processing unit (col. 4, lines 9-20).

In regards to instant claim 18, Archer et al. discloses a coal-fired boiler having a pulverizer in col. 2, lines 26-28.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 4,969,408 (Archer et al.) as applied to claim 1 above.

In regards to instant claim 3, the composition of atmospheric air is well known in the art. Archer et al. discloses that slagging is prevented by controlling temperature and the air/fuel mixture (Abstract). Coal composition analysis is disclosed in col. 2, lines 47-50. The modeling of boiler performance that is dependent on coal composition and heating value of the coal is disclosed in col. 1, lines 58-61. Col. 4, lines 55-65 discloses a relationship between pulverizers and air/fuel mixture, which has a relationship to heating values for coal and ash. Col. 2, lines 54-58 discloses the use of a bulk material analyzer for analyzing elemental composition and moisture content of materials. A boiler model is used for predicting operating conditions (Abstract). Archer et al. recites in claims 7-8 a method of using a computer for monitoring combustion of coal to heat a boiler comprised of steps of a) analyzing samples of coal to determine coal composition; b) calculating a heating value of the coal; c) determining desired operating conditions; d) measuring steam flow, temperature and pressure in the boiler, air and coal supply rates, wall and surface temperatures of the boiler and oxygen concentration in the stack gases; e) modeling boiler performance in dependence upon the steam flow, temperature and pressure, the air and coal supply rates, the coal composition and the

heating value of the coal to predict heat loss in the stack gases; and f) determining an air /fuel mixture capable of maintaining the desired operating conditions.

Archer et al. does not expressly disclose the elemental content recited in instant claim 3. However, it would have been obvious to the operator of the bulk material analyzer (col. 2, lines 54-58) to observe the elemental content as recited since it is expressly stated that the analyzer of Archer et al. is capable of measuring elemental composition and moisture content of materials (col. 2, lines 54-55).

In regards to instant claim 4, Archer et al. discloses the use of boiler model for predicting operating conditions (Abstract). Col. 2, lines 54-58 discloses the use of a bulk material analyzer for analyzing elemental composition and moisture content of materials.

In regards to instant claims 5-6, Archer et al. discloses a system that determines characteristics of fuel by continuously analyzing fuel using a bulk material analyzer for coal to determine compositions and heating values for coal and ash (col. 1, lines 53-56), and the use of a boiler model for predicting operating conditions (Abstract). Archer et al. discloses processing data in a processing unit (col. 4, lines 9-10; and claims 9-11), which correlates measurements using statistics – it is well known that equation sets are employed for statistical analysis (Fig. 5; and col. 4, lines 9-20). Col. 2, lines 54-58 discloses the use of a bulk material analyzer for analyzing elemental composition and moisture content of materials.

In regards to instant claims 7-9, Archer et al. discloses a system that determines characteristics of fuel by continuously analyzing fuel using a bulk material analyzer for coal to determine compositions and heating values for coal and ash (col. 1, lines 53-56), and the use of a boiler model for predicting operating conditions (Abstract). Archer et al. further discloses processing data in a processing unit (col. 4, lines 9-10; and claims 9-11), which correlates measurements using statistics – it is well known that equation sets are employed for statistical analysis (Fig. 5; and col. 4, lines 9-20).

In regards to instant claim 10, Archer et al. discloses the use of boiler model for predicting operating conditions (Abstract). Coal composition analysis is disclosed in col. 2, lines 47-50.

In regards to instant claims 11-14 and 19, Archer et al. recites in claims 7-8 a method of using a computer for monitoring combustion of coal to heat a boiler comprised of steps of a) analyzing samples of coal to determine coal composition; b) calculating a heating value of the coal; c) determining desired operating conditions; d) measuring steam flow, temperature and pressure in the boiler, air and coal supply rates, wall and surface temperatures of the boiler and oxygen concentration in the stack gases; e) modeling boiler performance in dependence upon the steam flow, temperature and pressure, the air and coal supply rates, the coal composition and the heating value of the coal to predict heat loss in the stack gases; and f) determining an air /fuel mixture capable of maintaining the desired operating conditions. Archer et al. discloses the use of boiler model for predicting operating conditions (Abstract). Coal composition analysis is disclosed in col. 2, lines 47-50. Col. 2, lines 54-58 discloses the

use of a bulk material analyzer for analyzing elemental composition and moisture content of materials.

In regards to instant claims 15-16, Archer et al. discloses a method of monitoring combustion of fuel using a computer for meeting operational criteria (col. 1, lines 42-47) and a system for monitoring combustion of coal in a boiler (Abstract). Archer et al. does not disclose the use of fossil fuel gas or fossil fuel oil as combustibles. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use gas or oil as combustible fuels since they are combustible fossil fuels like coal.

Response to Arguments

Applicant's arguments with respect to claims 1, 17, and newly added claim 20 have been considered but are moot in view of the new ground(s) of rejection.

For clarity, it appears that several of the new amendments to instant claims 1 and 17 have caused some issues with clarity regarding the subject matter recited by the instant claims. Newly added instant claim 20, seems to be a similar method to the invention recited by instant claim 1, and further recites several functions performed by devices during the method; however, it appears that the prior art of record discloses a computer, which is well known to be able to store and process information, and the use of data that comes from a boiler process and devices – the data includes used and unused fuel quantities, compositions of materials, fuel/air mixtures, etc., all of which is disclosed by the current prior art of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYAN T. KILPATRICK whose telephone number is (571)270-5553. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, In Suk Bullock can be reached on (571)272-5954. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. T. K./
Examiner, Art Unit 1772

/SAM P SIEFKE/
Primary Examiner, Art Unit 1772